NavMed P-369

UNITED STATES NAVY

MEDICAL NEWS LETTER

Vol. 43 Friday, 20 March 1964 No. 6

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MEDICAL NEWS LETTER

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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland 20014, giving full name, rank, corps, and old and new addresses.

The issuance of this publication approved by the Secretary of the Navy on 28 June 1961.

CIVIL DEFENSE PROGRESS IN 1963

From "Introductory Highlights" of the 1963 Annual Report, Department of Defense, Office of Civil Defense. *

Civil defense progress at the end of fiscal year 1963 was clearly evident on two distinct fronts:

First, noteworthy success in surveying, marking, and stocking of public fallout shelters resulted in changing the character and quality of civil defense in the United States by (1) reorienting civil defense plans and programs around the lifesaving potential offered by a nationwide fallout shelter system, and (2) identifying the least expensive methods of expanding this system.

Second, the Armed Services Committee of the House of Representatives conducted an exhaustive study of certain facets of civil defense, particularly those concerning fallout shelters. This completely objective study was extraordinary in that it was based on the extensive testimony of 108 witnesses, most of whom possessed a special competence in some field related to fallout shelters. All arguments against the program had to be answered in unequivocal fashion, and the House was provided the information needed for it to develop and pass legislation designed eventually to extend the lifesaving potential of the nationwide fallout shelter system to every American. This legislation, H. R. 8200, was passed by the House, and was referred to the Armed Services Committee of the Senate on September 18, 1963.

As described in the body of this report, the details of civil defense developments and accomplishments during the year show that a sound and substantial program has been formulated since major civil defense responsibilities were assigned to the Department of Defense 2 years ago. Basic elements of this program are operational and adequately based to support the action needed to make fallout protection available to everyone.

Some major facts on development status of the nationwide fallout shelter system at the end of fiscal year 1963 were:

1. Fallout shelter space for approximately 104 million persons had been located in existing structures. Of this amount, it is expected that shelter for 70 million persons can be marked, licensed, and stocked.
2. Owners of more than 50,000 facilities had signed shelter license agreements for use of space to protect more than 47 million persons.
3. Shelter space to protect nearly 43 million persons had been marked in approximately 54,000 facilities.
4. Cumulative procurement had been initiated for shelter supplies sufficient to serve 50 million persons.

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* The full report is for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402. Price 50¢.

5. Shelters in approximately 21,000 facilities had been stocked with supplies to serve nearly 10 million persons.

6. About 5000 county and municipal governments were active in local management and installation of shelter supplies.

Other major developments during the year included:

1. Establishment and implementation of civil defense functions as a mission of the Armed Forces to be performed prior to nuclear attack and during emergency conditions existing after attack.

2. Further extension in use of Department of Defense resources for civil defense to include training of radiologic monitors by the U. S. Continental Army Command and use of Standby Reserve officers in State and local civil defense work.

3. Establishment of Regional Civil Defense Coordinating Boards to coordinate the civil defense planning of military departments and Federal agencies in the field with State and local governments.

4. Use of approximately 15,000 Field Extension Service personnel of the Department of Agriculture in the rural civil defense program.

5. Increased emphasis on shelter use training and radiologic defense training, including decontamination, by development of additional courses offered civil defense personnel at Office of Civil Defense schools.

6. Expansion of training capability by initiation of a program for extension divisions at 51 State institutions of higher learning to train instructors in shelter management and radiologic monitoring and to conduct civil defense conferences with State and local officials.

7. Training of approximately 788,000 persons in medical self-help technics, more than 278,000 in civil defense adult education, and 4255 key civil defense personnel and instructors at OCD schools.

8. Strengthening of the data base for damage assessment in major resource areas; e.g., food, fuel, and power, construction equipment, water, health, and manpower.

9. Completion of plans for the Emergency Broadcast System (EBS), established on August 5, 1963, to replace CONELRAD (Control of Electromagnetic Radiations). The EBS will make approximately 1700 radio stations available to the President or his spokesman and to State and local governments for the purpose of keeping the citizenry informed during civil defense emergencies.

10. Work in progress on the National Emergency Alarm Repeater (NEAR) system, designed to give immediate indoor warning of impending attack. This included an analysis of 170 electric utility systems to determine size and location of NEAR signal generators and the testing of NEAR prototype generating equipment in 7 electric utility systems.

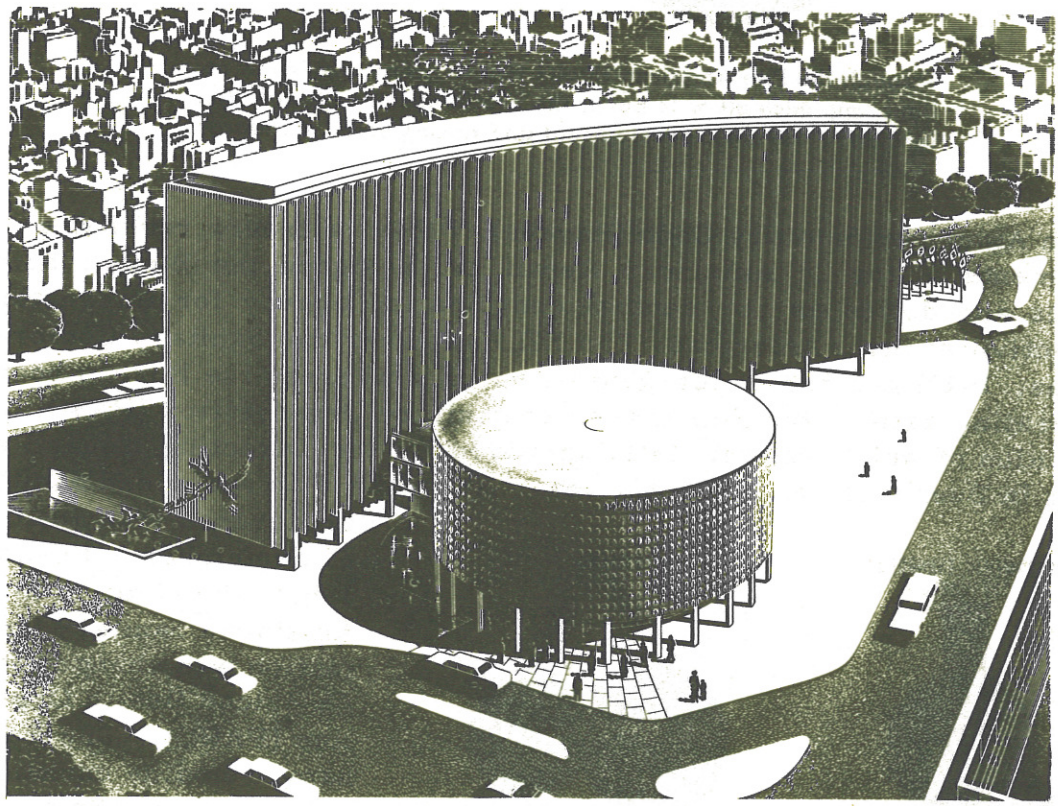
11. Activation of the Protective Structures Development Center at Fort Belvoir, Va., in December 1962, to provide facilities supporting the development of improved design and construction of protective structures and related equipment.

THE PAN AMERICAN HEALTH ORGANIZATION

Intergovernmental Health Agency for the Americas

THE PAN AMERICAN SANITARY BUREAU

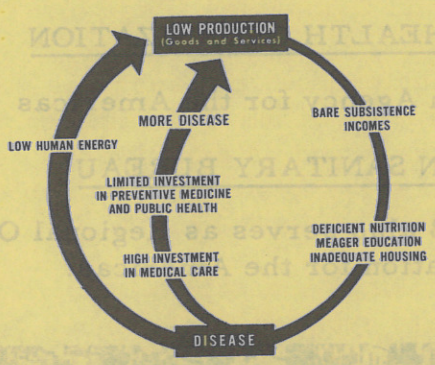
Secretariat of PAHO. PASB also serves as Regional Office of the World Health Organization for the Americas.



Artist's conception of the new PAHO headquarters building soon to be built at Virginia Avenue and 23rd Street, N. W., in downtown Washington, D. C., on land donated by the Government of the United States.

WHAT IT IS

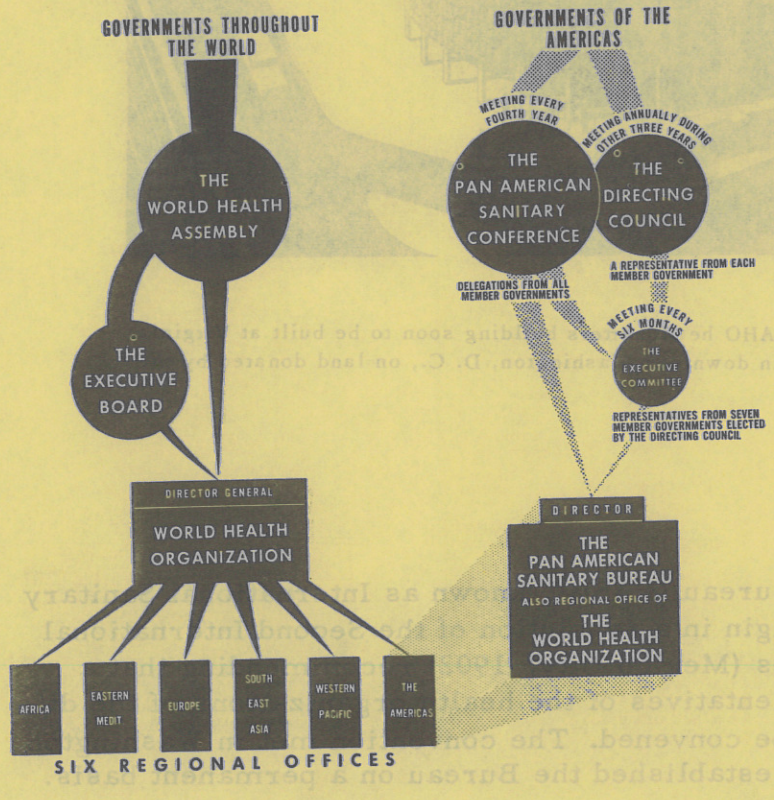
The Pan American Sanitary Bureau (PASB), known as International Sanitary Bureau until 1923, had its origin in a resolution of the Second International Conference of American States (Mexico City, 1902) recommending that a "general convention of representatives of the health organizations of the different American Republics" be convened. The convention met in Washington, D. C. in December 1902, and established the Bureau on a permanent basis.



THE ECONOMIC CYCLE OF DISEASE

Through the Pan American Health Organization, American nations help each other to better the health of their citizens, thus furthering economic development and raising social standards.

The Pan American Sanitary Code (Havana), 1924), a treaty ratified by the Governments of the 21 American Republics, assigned the Bureau broader functions and duties as the central coordinating agency for international health activities in the Americas. The XII Pan American Sanitary Conference (Caracas, 1947) adopted a reorganization plan whereby the Bureau became the operating arm of the Pan American Sanitary Organization (PASO), the Constitution of which was officially approved by the Directing Council at its meeting in Buenos Aires later that year. At the XV Pan American Sanitary Conference (San Juan, P. R., 21 September - 3 October 1958), the name of the Pan American Sanitary Organization was changed to Pan American Health Organization (PAHO). The Bureau's name remains unchanged.



Pursuant to the agreement concluded between PAHO and the World Health Organization (WHO) in 1949, PASB serves as the WHO Regional Office for the Americas. PAHO is also recognized by the Council of the Organization of American States as an Inter-American Specialized Organization with the fullest autonomy in the accomplishment of its purposes.

The Pan American Health Organization Comprises (Page 6):

1. The Pan American Sanitary Conference, the supreme governing authority in which all Governments of the Organization are represented, meets every four years and determines the general policies of the Organization, serves as a forum on public health matters, and elects the Director of the Bureau.

2. The Directing Council, composed of one representative from each Government, meets once a year between Conferences, reviews and approves the annual program and budget of the Organization, and acts on behalf of the Conference.

3. The Executive Committee, composed of representatives of seven Member Governments elected by the Council for overlapping terms of three years, meets twice a year to advise the Council on the activities of the Organization and carry out such other duties as the Council may assign to it.

4. The Pan American Sanitary Bureau which is the operating arm of the Organization.

The Director of the Pan American Sanitary Bureau is Dr. Abraham Horwitz of Chile, who began a four-year term of office on 1 Feb 1959 and was reelected at the XVI Pan American Sanitary Conference for a second term beginning 1 Feb 1963. On 1 Jan 1962, the regular staff of the Bureau numbered 902, representing 47 nationalities. Of this total, 666 were assigned to Zone Offices and field projects and 236 were stationed at the Washington Headquarters.

The fundamental purposes of PAHO are: To promote and coordinate efforts of the countries of the Western Hemisphere to combat disease, lengthen life, and promote physical and mental health of the people.

INTERNATIONAL PROFESSIONAL PERSONNEL ASSIGNED TO HEALTH PROJECTS IN COUNTRIES OF THE AMERICAS, AUGUST 1962

ASSIGNMENTS OF FIVE GROUPS OF PROFESSIONAL PERSONNEL

AREA	PHYSICIANS	NURSES	SANITATION PERSONNEL	SCIENTISTS	OTHER SPECIALISTS
TOTAL	106	42	114	46	109
Washington Headquarters	24	3	4	3	72
Zone Offices	9	6	4	0	10
Projects in countries	67	31	104	17	18
Intercountry Projects	3	1	0	10	4
Special Centers	3	1	2	16	5

The Pan American Health Organization is working together with the countries of the Americas and with other international organizations to achieve the objectives of the Act of Bogotá (1960) and the Charter of Punta del Este (1961). The Bureau cooperates with the Governments in the development and improvement of national and local public health services, provides consultant service, grants fellowships, organizes seminars and training courses, coordinates activities of neighboring countries having common public health problems, collects and distributes epidemiologic information and health statistics, and performs other related functions.

HOW THE WORK IS CARRIED OUT

At the Bureau Headquarters, the Director and his technical staff undertake the basic planning and coordination of activities. Advisory programs and services to the Governments are in five broad areas:

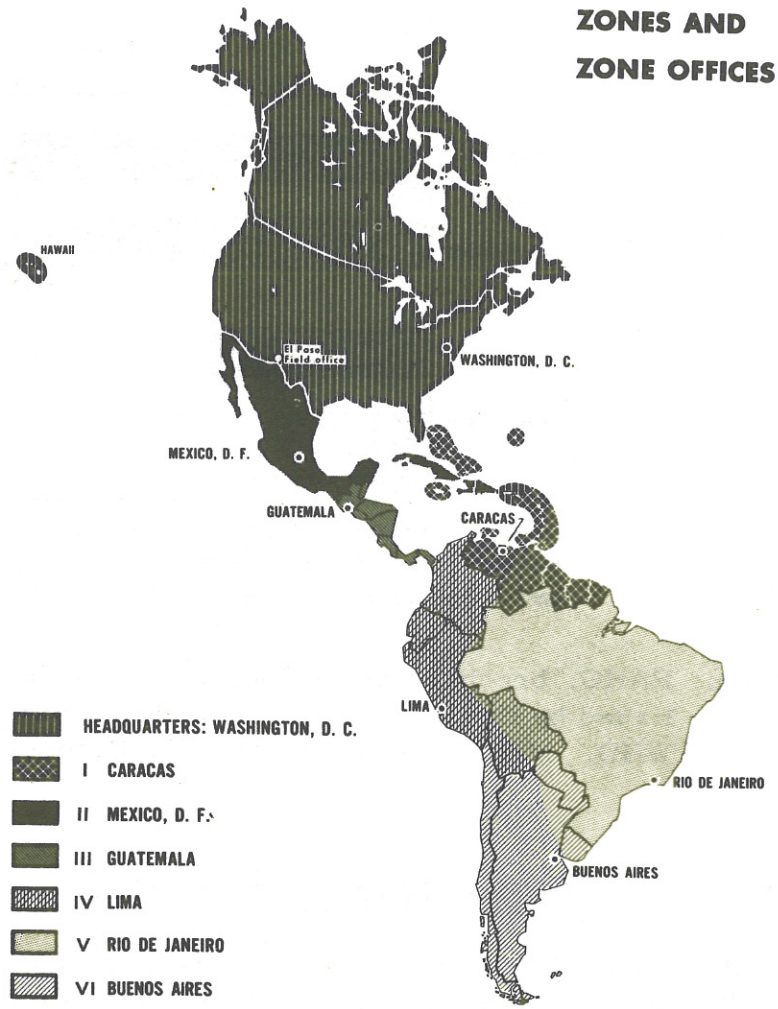
1. Eradication and Control of Communicable Diseases
2. Strengthening Health Services
3. Environmental Sanitation
4. Education and Training
5. Research

The eradication of malaria, smallpox, yaws, and the Aëdes aegypti mosquito (vector of urban yellow fever) in the Western Hemisphere is well under way, as are programs for the control of other communicable diseases. To strengthen health services, activities are directed toward the organization and improvement of basic services, such as maternal and child health, nutrition programs, statistics, and other specialized fields at both the national and local levels. Within a broad environmental sanitation program, the planning, financing, and administration of water supply projects are assisted in all phases. Education and training activities are concerned with the basic professional education of physicians, nurses, sanitary engineers, and other health workers and are also included in integrated health service programs. Support is given to efforts of American countries to develop their full potential for biomedical research.

The field activities of the Organization are administered from the six Zone Offices which maintain with the health authorities of the Governments the close relationship and consultation essential for planning and carrying out well balanced programs to meet health needs and problems at the national, interzone, and regional levels.

How the Work Is Financed

The Pan American Health Organization derives the funds for its operation from several sources. The first main source of support is the assessments on the Governments of the Pan American Health Organization. For the year 1962, the assessments amounted to $5,140,000 (36% of the Organization's total budget of almost 14.4 million dollars). An additional $100,000 for the regular budget comes from contributions of France, the Kingdom of the Netherlands, and the United Kingdom, and from miscellaneous income.



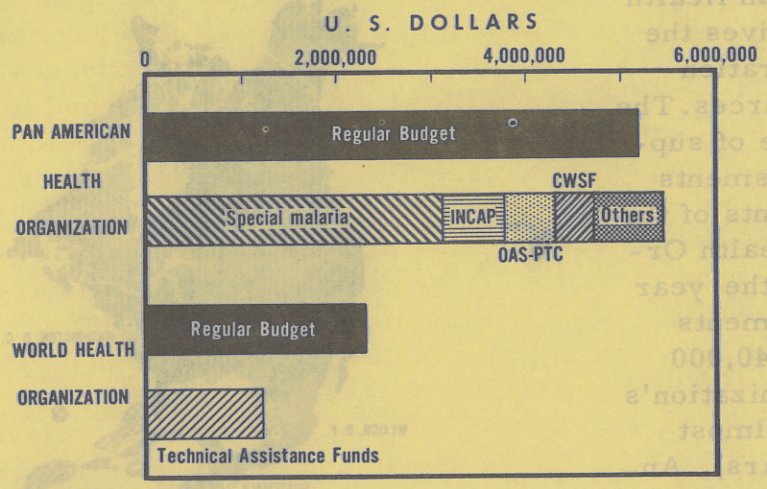
In addition, voluntary funds for special purposes are contributed by Governments and organizations in the Americas. The 1962 budget provides for expenditures of more than five million dollars from these contributions. The largest is the Special Malaria Fund to which voluntary contributions have been made by Colombia, the Dominican Republic, Haiti, the United States of America, and Venezuela.

Moreover, as the Regional Office of the World Health Organization for the Americas, PASB will receive approximately $2,410,360 from the WHO regular budget in 1962, and $1,289,848 from Technical Assistance funds of the United Nations. The total estimated budget from all sources in 1962 was $14,399,942.

The United Nations Children's Fund (UNICEF) cooperates with PAHO/WHO by providing supplies and equipment for health projects. Its participation in the health program in the last three years has averaged about $5,000,000 per year for malaria eradication and over $1,000,000 per year for other health projects.

(See Graph on page 10)

SOURCE OF FUNDS FOR PROGRAM OF THE PAN AMERICAN HEALTH ORGANIZATION, 1962



INCAP = Institute of Nutrition of Central America and Panama

OAS-PTC = Program of Technical Cooperation of the Organization of American States

CWSF = Special Community Water Supply Fund

From: PAHO, brochure of the Pan American Health Organization, published by the Pan American Sanitary Bureau Regional Office of WHO. Misc. Publication No. 70, October 1962.

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THE HUMAN THERMOSTAT - SUMMARY

Republished by permission of Reinhold Book Division of the Reinhold Publishing Corporation, 430 Park Ave., New York, N.Y., from Temperature - Its Management and Control in Science and Industry, Vol. 3, Part 3, Chapter 56, pages 662-663, a copyrighted (1963) publication of Reinhold.

By T. H. Benzinger, C. Kitzinger
Naval Medical Research Institute, Bethesda, Md.,
and
A. W. Pratt
National Cancer Institute, Bethesda, Md.

"Using cranial instead of rectal measurements of internal temperature and direct and continuous recording methods for the measurement of heat loss (by gradient layer calorimetry) and heat production (from oxygen consumption) the human mechanisms of temperature regulation in warm and in cold environments have been resolved in quantitative terms of reproducible stimuli and responses. The mechanism of 'physical' temperature regulation was

found to consist of physiologically meaningful and reproducible sudomotor and vasomotor responses to warm stimulation of the internal thermoreceptive system. No influence of warm reception at the skin upon sweating was detectable. (Diminution of sweating was observed, however, as a result of cooling the skin below the threshold of cold receptor responses.) On the other hand, the mechanism of 'chemical' heat regulation was found to consist of reproducible and meaningful responses to the stimulus of cold at the skin, counteracted by the reception of central temperature as it increases toward or beyond the set point for sweating.

Together, the two mechanisms provide a thermostatic control of astonishing power and precision. These calorimetric findings are consistent with the discoveries of classical experimental surgery: (1) a 'center' from which heat loss responses originate (anteroir hypothalamus), extremely sensitive to the stimulus of temperature, (2) a heat maintenance center (posterior hypothalamus) indifferent to the stimulus of temperature, relaying cold-receptor impulses from the skin (for shivering and increased heat production), and (3) inhibition of shivering when warm stimulation is applied to, and release of shivering when warm stimulation is removed from, the (anterior hypothalamic) 'heat loss center.'

Although the classical and the new experimental observations are not in contradiction anywhere, the classical conclusions and hypotheses need a thorough revision which will result in a much simpler concept. For both the anterior and posterior heat centers alike, classical theory had postulated (1) incoming sensory impulses from the skin, and (2) a peculiar power of responding to warm or to cold by changing their response sensitivities to these incoming sensory impulses, warm or cold.

The new experimental evidence does not support this complicated view. By calorimetry, the anterior center for warm was found not to receive warm-impulses from the skin. By neurosurgery (Hemingway), the posterior center for cold, which does receive and transmit cold-impulses from the skin, was found to be indifferent to temperature and, thus, was unable to modify afferent impulses with temperature.

Thus, hypothetical synaptic mechanisms with special sensitivities for warm and cold in both centers are not supported by experimental facts. Instead, combined calorimetric and neurosurgical evidence lead to one anatomically established organ in the brain, in which all central sensory functions for temperature are vested. This organ, a warm-sensor in the anterior hypothalamus below the anterior commissure, appears to possess the essential characteristics. Its receptors have a sharply determined threshold or set-point. Their sensitivity to the faintest temperature changes is extraordinary. The organ is thus functionally, as well as by the developmental anatomy of its matrix, comparable to the retina, our terminal sensor for light. It may be called a 'temperature-eye.' It exerts a tight control over the powerful responses in thermoregulatory heat production and heat loss.

It is by way of these effector mechanisms that the 'Human Thermostat' performs its task. Quantitatively, the causes and effects, stimuli, and responses in the system of human temperature regulation are no longer unknown.

The work reported here was supported under Research Contract #R-8 and R-38 by the National Aeronautics and Space Administration."

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CRANIAL MEASUREMENTS OF INTERNAL TEMPERATURE IN MAN

Republished from Temperature - Its Measurement and Control in Science and Industry, Vol. 3, Part 3, Chapter 10, page 120, Copyright 1963 - by permission of Reinhold Book Division of the Reinhold Publishing Corporation, 430 Park Ave., New York, N. Y.

T. H. Benzinger
Naval Medical Research Institute
and
G. W. Taylor
Naval Hospital, National Naval Medical Center,
Bethesda, Maryland

"Cranial measurements of internal body temperature on man were introduced to replace the rectal measurement in studies of the physiologic mechanisms of temperature control. Although taken in places of different location, circulatory requirements and metabolic characteristics, cranial (including tympanic) measurements showed consistent patterns during applications of external or internal stress of warm or cold. Under the same conditions, rectal measurements deviated widely from cranial observations. Furthermore, it was not possible with rectal measurements to establish reproducible relations between thermal stimuli and thermoregulatory responses. Cranial measurements of internal temperature were found to be reproducibly and quantitatively related to thermoregulatory responses in heat or cold. The brush-type tympanic thermocouple is introduced. This probe holds itself to the eardrum with minimum discomfort for indefinite periods in cranial clinical thermometry."

ADDENDUM prepared for the U. S. Navy Medical News Letter by Dr. Benzinger:

It is, therefore, expected that the method will replace the rectal and esophageal measurements of body temperature in the future, not only in operating, emergency, and recovery rooms, but also on patients-wards, in doctors' offices and in homes. For these applications the technical development of a reading-instrument for the electrical potential from the thermocouple is, of course, a necessary presupposition. The main advantages of the method will be: (1) Reading of undistorted patterns of temperature near the central nervous system, not in the rectum where there are no thermoreceptors or centers of the thermoregulatory system; (2) Immediate and convenient reading while probe is in place; (3) Cleanliness of the procedure as it will avoid the rectum and will apply a new cheap and disposable probe for each individual reading or recording; (4) Derivation of the measurement from the head, the convenient location for the anesthesiologist; (5) No interference with airways as in esophageal thermometry during anesthesia.

Injurious Consequences of Maximal Isometric Arm Exercises

By Major George E. Ottot, U.S. Marine Corps, Physical Fitness Coordinator.

Ref: (a) U.S. Navy Medical News Letter, Vol. 42, No. 11, page 13

Reference (a) includes an article regarding Injurious Consequences of Maximal Isometric Arm Exercises. The article summarizes a study performed by Philip J. Rasch Ph D, of the Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

From the results of the study, it was reported that eleven of fifteen subjects tested developed severe muscle pains after performing maximal isometric contractions of the forearm flexors. The subjects performed maximum isometric contractions throughout the program against the static resistance of a stationary bar. The article reads: "Normally, when an individual flexes the forearm against an immovable bar, the wrists drop into a position of hyperextension in an attempt to relieve stress created in the wrist flexors as the powerful elbow flexors seek to produce a concentric contraction of the forearms. In this investigation, subjects were required to maintain the wrists in line with the forearms in order to insure that contraction was as fully isometric as was mechanically possible. Presumably the resulting strain on the wrist flexors became intolerable and resulted in physical damage to some of the weaker fibers."

The subject article includes a reference to the Navy-Marine Corps exercise pamphlet SHAPE-UP. It should be noted that SHAPE-UP instructions for executing isometric exercises clearly specify that only 50% of maximum pressure should be applied during the first week of such exercises. This instruction was included for the express purpose of diminishing any possibility of muscular strain as a result of performing maximal isometric contractions. Additionally, SHAPE-UP illustrates forearm flexor exercise being performed in a manner which would cause the wrists to drop into a position of hyperextension, thereby tending to relieve stress on the wrist flexors and to eliminate any muscular strain.

A 10-week evaluation was recently completed by the Marine Corps involving fifteen subjects who executed maximum isometric exercises of the forearm flexors against a bar in exactly the manner described by Rasch. During this 10-week period, there was not one instance of injury as described by Rasch, nor was any other area of the body so affected.

The subject article ends with the statement: "Results of this study suggest precaution in prescribing maximal biometric forearm flexion exercise for healthy adult males." The Marine Corps concurs in this and has, in fact, developed isometric exercise programs within the framework of adequate precautionary measures.

The above information is offered to allay any misgivings concerning the use of isometric exercises as described in SHAPE-UP and other official

isometric exercise publications issued by the Navy and Marine Corps and currently being used to improve physical fitness.

It is recommended that the substance of the foregoing be promulgated in an early Medical News Letter in order to prevent possible misconceptions and misinterpretations which might prove damaging to effective, carefully developed fitness programs.

/s/ George E. Ottot, Major USMC
Physical Fitness Coordinator

NOTE: As a matter of interest, Major Ottot sent a copy of the above article to Doctor Rasch for his comments. He replied that he had no criticism of the article and, in fact, was in agreement with it. It is believed that Major Ottot has rendered a valuable service in proving the safety of the official Isometric Exercise Programs of the U. S. Navy and Marine Corps, as well as demonstrating the complete reliability of the official isometric exercise publications including SHAPE-UP which are important in the operation of an ever improving physical fitness program throughout the Navy and Marine Corps. It is gratifying to receive articles of this type which assist readers in the correct interpretation of potentially questionable issues. Our congratulations to Major Ottot and to Doctor Rasch.

—Editor

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Chromosome Studies in Adult Acute Leukemia

P. H. Fitzgerald, Angela Adams, and F. W. Gunz B E C C. Cytogenetics Unit, Christchurch Hospital, Christchurch, New Zealand. J Nat Cancer Inst 32: 395-417, 1964.

Chromosome studies of 18 adults with acute leukemia are reported. Blood cultures showed few abnormalities, but abnormal genotypes were found in each of the 11 patients in whom direct examinations of the bone marrow were made. The chromosome abnormalities were unique in each patient and consisted of both numerical and structural changes; they could not be correlated with any clinical or hematologic features. When the marrow was examined repeatedly in individual patients, the abnormalities persisted regardless of the stage of the disease, though some diminution in their number occurred during remissions. The findings suggest that the chromosome abnormalities are intimately associated with, and perhaps an essential part of, the development of acute leukemia.

* * * * * *

Surgeons General of the Past

By E. P. Kuhn JO1 USN

The 19th Chief of the Bureau of Medicine and Surgery and 15th Surgeon General of the Navy, William C. Braisted MD, was born in Toledo, Ohio on 9 October 1864. In 1883, he received the Bachelor of Pharmacy degree from the University of Michigan and, in 1886, was awarded the degree of Doctor of Medicine, graduating as honor man in his class from the College of Physicians and Surgeons, Columbia University in New York City. After interning at Bellevue Hospital in New York, he practiced medicine in Detroit from 1888 to 1890. During that period he served as assistant Neurologist at Harper's Hospital, visiting physician to Women's Hospital, and attending surgeon at Jenks Sanitarium for Women.

On September 24, 1890, Doctor Braisted was appointed as Assistant Surgeon in the U. S. Navy with the rank of Lieutenant (junior grade). He was

decorated with the Order of Bolivar by the President of Venezuela for his bravery in caring for the wounded during the battle of Puerto Cabello. Also, he earned the Spanish Campaign Medal. Later on, his report of the medical organization and work of the Japanese during the Russo-Japanese War won him a decoration by the Emperor of Japan.

Through successive promotions, Doctor Braisted advanced to the rank of Captain in the Medical Corps. He was appointed Assistant to the Chief of the Bureau of Medicine and Surgery in 1906 and during that tour of duty had charge of reorganizing the Bureau. He was instrumental in initiating the U. S. Naval Medical Bulletin, the first issue of which was published in April of 1907 during Surgeon General Rixey's administration. For a year, during the second term of President Theodore Roosevelt, he served as Attending Physician at the White House. He also helped in reorganization of the Hospital Corps and establishment of the Navy Nurse Corps in May 1908.

In February 1914, Doctor Braisted was appointed Surgeon General and Chief of the Bureau of Medicine and Surgery with the rank of Rear Admiral in the Medical Corps. He assumed the initiative in the construction and administration of the most modern naval hospitals, and in the establishment of special training schools for the Hospital Corps. Under Admiral Braisted, the first hospital ship of the Navy was designed and fitted out from the keel up to meet definitive patient care requirements of the United States Fleet. Launched at the Philadelphia Navy Yard in December 1920, it was christened the USS RELIEF.

Admiral Braisted assisted in abolition of wine messes in the Navy. He founded the Handy Book for the Hospital Corps, U. S. Navy (later termed Handbook), the Manual of the Medical Department for Medical Department Officers, and a supplement to the U. S. Naval Medical Bulletin entitled Hospital Corps Quarterly for the continuing training of Hospital Corpsman.

When World War I erupted, Admiral Braisted responded with tireless energy. An outstanding administrator, he promptly implemented efficient plans and rapidly expanded all aspects of Navy Medical Department support in the total war effort. Additionally, he was Vice Chairman of the War Relief Board of the American Red Cross and a member of its executive and central committees, and was a member of the Council of National Defense and the General Medical Board in 1917. For his war service he was awarded the Distinguished Service Medal which carried the citation "For exceptionally meritorious service in a duty of great responsibility as Chief of the Bureau of Medicine and Surgery." He also earned the World War I Victory Medal.

Admiral Braisted was serving his second term as Surgeon General at the time of his transfer to the retired list on 29 November 1920. He made his home in West Chester, Penna., where he lived until the time of his death, 17 January 1941. Interment was in Arlington National Cemetery.

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Admiral McDonald Reelected President of Navy Mutual Aid Association

The Board of Directors of the Navy Mutual Aid Association at their Annual Meeting on 20 February 1964 announced the reelection of Admiral David L. McDonald USN as President. Other officers elected by the membership were Rear Admiral A. H. Van Keuren USN RET; First Vice President; Vice Admiral V. R. Murphy USN RET, Second Vice President; Lieutenant General C. H. Hayes USMC, Third Vice President; Vice Admiral K. K. Cowart USCG RET, Fourth Vice President; and Captain P. R. Engle MC USN, Vice President-Medical Director. Elected to the Board of Directors were:

RADM L. A. Bachman USN RET
RADM J. W. Bottoms SC USN
ADM Arleigh Burke USN RET
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RADM J. W. Crumpacker SC USN
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CAPT G. D. O'Brien USNR
LCDR J. F. O'Neil USN
BRIGEN R. R. Van Stockum USMC

The Board of Directors reappointed Captain T. S. Dukeshire SC USN RET, as Secretary and Treasurer, and Lieutenant Commander M. E. Koepke MSC USN RET Assistant Secretary and Treasurer. Vice Admiral V. R. Murphy USN RET was continued in office as Chairman of the Finance Committee; Vice Admiral K. K. Cowart, USCG RET as Chairman of the Membership Committee; and Rear Admiral L. A. Bachman USN RET, Chairman of By-Laws Committee.

The Chase Manhattan Bank of New York was continued as investment counsel for the Association and the Morgan Guaranty Trust Company of New York retains custody of the Association's securities. The actuarial firm of Bowles, Andrews & Towne of Richmond, Va., will continue to serve as the Association's actuarial advisor. Captain Dukeshire reported that in 1963 the goal of 40,000 members was passed and that the Association's assets were increased by 12% to more than $68,000,000.

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Psychiatry Teachers Study Uses of Television and Film

Sixty representatives of medical school departments of psychiatry in the southern region of the United States and the Washington, D. C., area participated in a Conference on the Uses of Television and Film in Teaching Psychiatry at the National Naval Medical Center, Bethesda, Md., on 22 and 23 January 1964. Dr. Lawrence Kolb, Director of New York Psychiatric Institute, delivered the keynote address. Demonstrations of videotapes and films useful for various kinds of instructional purposes in psychiatry were given by

Drs. L. C. Hanes, University of Mississippi Medical Center; Richard Meiller, Medical College of Virginia; William Cantrell, Baylor University College of Medicine; J. Earl Somers, University of North Carolina School of Medicine; Lou Woodward Marshall, Medical College of Georgia; and Floy J. Moore, University of Mississippi Medical Center.

A panel on Administrative and Technical Aspects of Film and Television in Psychiatry included presentations and discussion by Dr. Floyd Cornelison, Chairman, Department of Psychiatry, Jefferson Medical College; CDR Edward Bird, Television Project Officer, Bureau of Medicine and Surgery, Navy Department; and Mr. M. C. Shaffer, Director, Visual Education Department, Medical College of Virginia.

General sessions were chaired by Dr. Charles Watkins, Head, Department of Psychiatry and Neurology, Louisiana State University School of Medicine; Dr. William G. Reese, Head, Department of Psychiatry, University of Arkansas Medical Center; and Dr. William K. Keller, Acting Chairman, Department of Psychiatry, University of Louisville.

Participants discussed instructional and technical aspects with resource personnel and recommended interinstitutional projects for cooperative production of recorded materials for the psychiatric instruction of undergraduate medical students, residents in psychiatry, and general practitioners.

The program was presented by the Southern Regional Education Board with cooperation of the National Naval Medical Center.

—From Educational Television Bulletin, Southern Regional Education Board, 130 Sixth St., N. W., Atlanta 13, Ga.

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Naval Medical Research Reports

U. S. Naval Medical Research Institute, National Naval Medical Center, Bethesda, Md.

1. Animal Calorimetry: Its Furue R 005.03-0050.02 Report No. 8, June 1962.
2. Plasmodium Lemuris N. SP. from Lemur Collaris E. Geoffroy: MR 005.09-1030.02 Report No. 8, May 1963.
3. Lipid Glyceride Synthesis by Rat Skeletal Muscle: MR 005.12-1100.02 Report No. 16, May 1963.

U. S. Naval Medical Research Unit No. 3, Malakal Sub-Unit, Cairo, Egypt

1. Preliminary Findings of Surveys for Brucella Antibodies in Ethiopia and Central Sudan: MR 005.09-1150, January 1964.
2. Serum Protein Electrophoresis in Sudanese Kala-Azar with Two Case Histories: MR 005.09-1603.7, January 1964.

U. S. Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

1. A Five-Year Research Program. Camp Lejeune - Parris Island Studies, 1959 - 1964.

U. S. Naval Medical Research Laboratory, U. S. Naval Submarine Base, New London, Conn.

1. Ultraviolet Air Sterilization for Polaris Submarines: MR 005. 14-3002-4. 09 Report No. 408, August 1963.

U. S. Naval Hospital, Oakland 14, Calif., Clinical Investigation Center.

1. Biochemical Basis of Glomerular Dysfunction: MR 005. 12-1608, 1963.

U. S. Naval School of Aviation Medicine, Naval Aviation Medical Center, Pensacola, Fla.

1. Perception of the Postural Vertical Following Prolonged Bodily Tilt in Normals and Subjects with Vestibular Defects: MR 005. 13-6001 Subtask 1 Report No. 81, June 1963.
2. The Prognostic Value of the Cold Pressor Test and the Basal Blood Pressure Based on an Eighteen-Year Follow-up Study: MR 005. 13-3001 Subtask 2 Report No. 6, July 1963.
3. A Longitudinal Study of Healthy Young Men - Correlation Coefficients: MR 005. 13-3001 Subtask 2 Report No. 7, July 1963.
4. Ballistocardiographic Analysis Utilizing Mathematical Model and Photo-electric Analog: MR 005. 13-7004 Subtask 6 Report No. 10, July 1963.
5. Proposed Speech Discrimination Test for Senior Naval Aviators: MR 005. 13-3001 Subtask 9 Report No. 1, August 1963.
6. Incidence of Physiological Symptoms in Healthy Men After Exposure to Rapid Decompression to 43, 000 Feet Simulated Altitude: MR 005. 13-1002 Subtask 9 Report No. 3, September 1963.
7. Determination of Fire Hazard in a Five PSIA Oxygen Atmosphere: MR 005. 13-1002 Subtask 11 Report No. 4, September 1963.
8. Effect of Vibration and Restraint on Body Weight and Survival of the Albino Rat: MR 005. 13-1002 Subtask 17 Report No. 5, September 1963.
9. Predicting Success in Aviation Training: MR 005. 13-3003 Subtask 10 Report No. 7, September 1963.
10. Exploratory Investigation of the Relationship Between Four Personality Measures and Voluntary Resignation from Aviation Training: MR 005. 13-5001 Subtask 1 Report No. 25, September 1963.

U. S. Naval Medical Research Unit No. 2, Taipei, Taiwan.

1. Preliminary Experiments on Effects of Chemical Histamine-Liberators, Local Edema, and "Wind Vegetables" of Taiwan on the Mast Cells of the Rat: MR 005. 09-1901. 1. 4, May 1963.
2. Summaries of Research, January - June 1963.
3. Intestinal Morphology in Human and Experimental Cholera: MR 005. 09-1040. 1. 12, July 1963.
4. Epidemiology of Japanese Encephalitis Virus on Taiwan in 1961: MR 005. 09-1201. 2. 9, July 1963.
5. Intestinal Parasites of Man in Palawan, Republic of the Philippines: MR 005. 09-1601. 1. 2, July 1963.

FROM THE NOTE BOOK

Toward a More Useful Health Record. Page Change 14, Manual of the Medical Department, contains modifications to Article 16-12, 16-48, 16-66, and 16-69 tending toward a more complete record of medical history in each member's current Health Record.

The purpose: to afford the attending physician needed information concerning previous illnesses and special examinations without reference to medical records maintained in BuMed. Under the new procedures, the original of the Narrative Summary (SF 502) covering periods of inpatient hospitalization plus the reports of baseline electrocardiograms and baseline audiograms are to be permanently retained in each member's current health record throughout periods of active duty. As in the past, a copy of the SF 502 will be placed in the hospital clinical record of the member concerned. For officers, the original plus one copy of the SF 502 will be placed in the Health Record. The copy will be retired to BuMed along with the Standard Form 600 and other medical records following completion of the annual physical examination or, if the officer is exempt from an annual physical examination, at the end of the calendar year.

It must be emphasized that, even though the SF 502 is now retained in the member's current Health Record, certain entries are still required on the Standard Form 600 (Chronological Record of Medical Care). These required entries show activity, date of admission, diagnoses, and diagnostic number for which treated, line of duty and misconduct determination, and the method and date of disposition.

—From Physical Qualifications and Medical Records Division, BuMed

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Important MSC Training Announcement

Commencing with the 1964-1965 academic year (Class 26) at the Naval School of Hospital Administration, National Naval Medical Center, Bethesda, Md., convening in August 1964, the course in English Composition offered will be ENGLISH 2; therefore, the basic introductory course in English Composition, usually titled ENGLISH COMPOSITION 1, is a highly desirable prerequisite. English Composition 1 can be completed by enrolling for the course at an accredited college or university, or by completing the USAFI correspondence course ENGLISH COMPOSITION 1 (Course number CC-400 or C. D. 400). MSC officers who anticipate attending NSHA at some future date should complete the English 1 requirement at the earliest practicable date and forward the results thereof to the Bureau of Medicine and Surgery, Code 35.

—MSC Division, BuMed

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Appointment of Navy Consultant for Optometry. The Surgeon General, Rear Admiral E. C. Kenney MC USN, has appointed Doctor William Greenspon as Civilian Consultant in Optometry in the Navy. Doctor Greenspon has held many posts in optometric organizations, thus contributing much to the profession of Optometry. He is a graduate of the Philadelphia College of Optometry and a Fellow of the Academy of Optometry. In 1962, he received an honorary degree of Doctor of Ocular Science from the Illinois College of Optometry, and is Director of the American Optometric Association's Department of National Affairs.

Workable Innovation for the Blind at USNH Philadelphia. Under the direction of the Pennsylvania Office for the Blind, a snack bar has been opened at the USNH Philadelphia. Sponsored by this organization, blind persons are trained for this work and equipment is provided; the operator furnishes merchandise at his own expense. Usually, a sighted person oversees the operation. A small percentage of profit goes to the Pennsylvania Office for the Blind for maintenance of equipment and development of the program. The operator receives the balance of profit. More than 140 snack bars of this type have been opened in Pennsylvania since 1952. This is the first to be set up in a Naval Hospital.

Commanding Officer, Walter Reed Army Medical Center, Commends Miss Saylor of A. R. C. Miss Jean Saylor, Recreation Supervisor, American Red Cross, who recently reported for duty at the U. S. Naval Hospital in Philadelphia, received a Certificate of Achievement for outstanding services rendered while assigned to the Walter Reed Army Medical Center—her last duty station. The following certificate from Major General A. L. Tynes MC USA, Commanding Officer of the Medical Center, was presented to Miss Saylor by Captain J. A. Syslo MC USN, Commanding Officer of USNH Philadelphia.

"Miss Saylor planned, organized, and administered the recreation program at the Walter Reed Army Medical Center in a superlative manner, combining her training and experience with an exemplary ability to express herself orally and in writing. She was responsible for much of the development, supervision, coordination, and interpretation of medically approved recreation for patients, and had the overall responsibility for the training of the recreation staff. Her awareness of public relations helped develop community contacts, furthering the good will between the Center and the civilian community. Throughout her service she displayed a thorough knoweldge and understanding of the hospital, its patients, and their illnesses and injuries as related to recreation. These attributes reflect credit upon Miss Saylor as an individual and upon the American Red Cross."

Miss Saylor holds a B. S. degree in Education and Social Studies. Since entering the American Red Cross as a Recreation Worker at Fort McClellan, Alabama, in 1943, she has served widely, including foreign service in Germany, France, Korea, and Japan.

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DENTAL SECTION

Properties and Procedures of Silicones for Soft Denture Bases

J. Den. Res. 43(1):118-120, January-February 1964. George W. Barnhart, Zoller Memorial Dental Clinic, University of Chicago, Chicago, Illinois.

In making a brief reference to soft relining resins, Paffenbarger and Bowen have indicated that a more extensive use would be made of them as the resins improved in quality. Clinical results employing silicones as denture-cushioning materials in a variety of intraoral situations have been reported.

It is important to note that not all silicone rubbers are suited for use as a denture-base substance and that the toxicity, strength, durability, plus ease of handling are features to be considered. McGregor in writing on toxicologic studies of silicone materials of many types, has stated that silicone rubbers have a low order of toxicity and that their toxicologic properties depend, not on the base polymer, but on the fillers and additives used. He further stated that numerous feeding experiments with rats, rabbits, and dogs have shown no interference with metabolic functions and that normal growth rates have been maintained. Intradermal, subcutaneous, or intramuscular injections did not cause any inflammation or other discernible disorder.

Special medical-grade silicone stocks are available that are extremely low in toxicity. They have been used to produce tubing and prosthetic heart valves for permanent implants in both animals and humans. Only those stocks free of toxic agents, which have been proved physiologically inert, should be selected for special medical and dental uses.

Medical Silastic 372, Dow Corning Corporation, silicone was selected because of its ability to fill the specific needs of a soft-denture-base material. These needs include: compatability with oral tissues and denture-base materials, lack of taste (once cured), dimensional and chemical stability, long-term retention of softness or resilience, and the need for a material that does not support bacterial growth, and thus precludes fouling.

The adhesive Experimental Soft Denture-Base Material Q-9-0123, Dow Corning Corporation, is a specialized silicone originally developed as a medical-grade adhesive for adhering silicone rubber to itself as well as to many other materials. It is a soft paste that can be easily spread with a spatula, and there are no solvents present. It has been found to lend itself to present-day dental techniques, and alone it serves very well as a soft-denture-base material.

The adhesive material may be used as the denture liner in the following manner:

1. The wax-model denture is constructed in the conventional manner, invested in the processing flask, wax boiled out, and a liquid-foil separating agent is painted onto the stone-mold surfaces of the flask half containing the teeth.

2. Prior to packing the acrylic plastic into the mold, the desired thickness of the eventual silicone denture liner is formed on the stone model in its half of the processing flask, using dental-base-plate wax. This wax spacer is formed just short of the full extent of the denture's periphery. By forming the wax spacer in this manner, the resultant denture will contain a soft liner extending down to the deepest portion of the periphery, while the acrylic-plastic portion is finished and polished so as to roll up and away from the junction of the two materials.

3. The acrylic plastic is packed into the mold cavity with a sheet of separating plastic between the model half of the flask, containing the wax shim, and the mold half. With the mold half loaded with the acrylic plastic, following two or more trial packings to insure a completely filled mold, the flask is parted.

4. At this point the uncured acrylic is painted with the (RTV) primer, which is then allowed to dry for a fifteen-minute period.

5. During the primer drying time the wax shim is removed, and the model and the land area of the lower half of the flask are painted with a separating medium of a 10 per cent solution of detergent and water.

6. The silicone adhesive soft denture lining material is expressed from its tube onto the primed acrylic surface in such a manner as to preclude the formation of voids and to a slight overloading of the space created by the wax shim.

7. With the mold space filled to slight excess, the flask is closed together until there is metal to metal contact, and the flask is placed in its processing press or clamp and introduced into a water bath. The bath temperature is elevated to 165° F. where it remains for an overnight cure period. The silicone material vulcanizes as the acrylic plastic cures, and the bond between the two materials is most satisfactory.

8. Following the processing, the denture is recovered, and the finishing of the periphery may be accomplished by using a dental arbor band to trim away any flash material. The final finishing of the soft material at the junction line may be achieved by using either a small, sharp scissors or surgical blade. Conventional methods are used to polish the acrylic-resin portion of the denture.

A new and simple technique is presented for the use of silicone materials as a soft-denture-base liner that provides greater flexibility in selecting a material and technique that can best be adapted to each intraoral situation requiring the use of soft materials.

The heat-vulcanized material was found to be most valuable where greater strength is needed, such as in obturated cases. However, the RTV

adhesive material was not only considered valuable in a heat-curing technique, which provided liners for new acrylic-resin dentures, but equally valuable in the room-temperature-vulcanizing method, in which an existing denture can be relined with a soft base.

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Mouth Protectors Reduce Dental Injuries

The role that mouth protectors play in reducing dental injuries becomes more prominent each year. Football players have been required since 1962, by the National Alliance Football Rules Committee, to wear the intraoral mouth protectors.

Throughout the Navy, emphasis has been placed on the use of mouthguards in all contact sports. Particularly remarkable is the record at the U. S. Naval Academy, Annapolis, Maryland. During the past year, only one dental injury was reported in the entire brigade of over 3,800 midshipmen.

A survey of claims made to the New York State High School Athletic Plan, Incorporated, showed a 53% reduction between the 1952-58 and 1962-63 school years.

Perhaps the reduction to almost zero injuries at the Naval Academy, in contrast to the 53% reduction in the New York study, can be attributed to the emphasis on the need to wear the custom-made protectors during practice sessions as well as in schedule competition.

In addition to the emphasis on when to wear the mouthguard, two other factors are contributing to the successful reduction of injuries. One, the mouthpieces are carefully fitted for each individual. This makes them more comfortable and thus more acceptable. The other, when the mouthguards are delivered, directions are included for proper care and cleaning, and a plastic perforated container is provided.

The low costs of the material and equipment and the short time required by the dental officer and technician combine to make this highly effective procedure a must for all involved in contact sports.

—Dental Division, BuMed

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Personnel and Professional Notes

Participation During National Children's Dental Health Week. Many Navy dental activities have reported an active participation during National Children's Dental Health Week, February 2 to 8. Typical of actions taken were those of five dental officers from the Submarine Base at New London, Groton, Connecticut. LCDR Joseph I. Tenca and Lieutenants John P. Williams, David H. Monahan, Robert W. Corsello and Sam Poidmore delivered talks to children of the elementary schools in the New London area. They empha-

sized the importance of nutrition and proper oral hygiene in the preservation of dental health.

Navy Dentist Presents Talk Before Research Group. CAPT Fred L. Losee, DC, USN, U. S. Naval Training Center, Great Lakes, Ill., presented a talk entitled, "Soils, Minerals and Health," before the Naval Reserve Research Group 9-1, on 11 February 1964, at Navy Pier, Chicago, Illinois.

Capt Losee, will also be on the TV program, "Science Unlimited." He will appear as Professor Mariella's guest, discussing research. The program will be shown in Chicago, New York, and Los Angeles, at different times in the latter part of May. Capt Losee will discuss the results of studies in New Zealand, and some of the studies underway at Great Lakes.

Presentation At Greater New York Dental Meeting. CAPT Roger G. Gerry, DC, USN, Chief of Dental Service at U. S. Naval Hospital, St. Albans, New York, and Diplomate, American Board of Oral Surgery, participated in a seminar at the Greater New York Dental Meeting on 6 December 1963. The seminar was titled, "Geriatric Considerations in Dentistry." CAPT Gerry's topic was, "Immediate Denture Service for the Elderly and Chronically Ill."

(Medical News Letter 42(11):23)

Presentation Of Navy Dental Film To Local Dental Society. CDR J. D. Shaw, DC, USN, presented the Navy Training Film entitled, "Endodontics," along with a talk before the Washoe County Dental Society at their recent meeting in Reno, Nevada.

CDR Shaw is the Dental Officer at NAAS, Fallon, Nevada.

Table Clinics At Charleston Dental Society. Navy Dental Officers of the Charleston, South Carolina area hosted a meeting of the Charleston Dental Society on 28 January 1964. CAPT William Seidel, DC, USN, SIXTH Naval District Dental Officer, was the Program Chairman. The following table clinics were presented:

CAPT W. D. King, DC, USN Naval Station	"Compound Reinforced Alginate Impressions"
CAPT A. P. Giammusso, DC, USN	"Helpful Hints in Surgical Management"
LT P. F. Regan, DC, USNR Naval Hospital	
LCDR C. G. Strange, DC, USN Naval Station	"Characterization of Anterior Acrylic Bridgework"
LT L. J. Bain, Jr., DC, USNR LT F. J. O'Bosky, DC, USNR Naval Station	"The Amalgam Pin Technique"

Bay Area Armed Forces Dental Study Group Meeting. The Dental Department at Mare Island Naval Shipyard, Vallejo, California, headed by CAPT R. D. Koepke, recently served as host for the monthly meeting of the Bay Area Armed Forces Dental Study Group, held on February 11.

A group of 60 dental officers from Army, Navy, Air Force, Coast Guard, and Public Health Service dental facilities in the San Francisco Bay Area assembled at the Officers' Club at Mare Island Naval Shipyard to hear a presentation by CAPT M. A. Mazzarella, DC, USN, who is currently on duty at the Naval Medical Research Unit, University of California, Berkeley, California. His topic was "The Relationship of Oral Environment to Dental Caries" - with studies conducted in Egypt (Oral Survey of Siwa Oasis). Accompanying his presentation, a complete selection of color slides was utilized to illustrate the environmental conditions existing at the Siwa Oasis in Egypt. The lecture gave the Dental Officers of the Armed Forces an insight into the areas of dental research conducted by the Navy Dental Corps.

NAS Willow Grove Hosts Local Dental Society. The Dental Department of the Naval Air Station, Willow Grove, Pennsylvania, acted as host at a dinner and meeting of the Montgomery-Bucks Dental Society (a component of the Pennsylvania State Dental Society), on January 27, 1964. A total of 170 civilian dentists from nearby communities, dental officers from U. S. Naval Dental Clinic, Philadelphia, Pennsylvania, Fort Dix, New Jersey, and McGuire Air Force Base, New Jersey, heard Captain John F. Bucher, DC, USN, present a talk on the "Role of Endodontics in Modern Dental Practice." Captain Bucher is Head of the Operative Dentistry Department and Endodontics Division of the U. S. Naval Dental School, Bethesda, Maryland. Following the talk, a film was presented on the use of closed chest heart massage, and practice in the technic performed on a mannequin.

Dental Clinic Wins Sports Trophy. The U. S. Naval Dental Clinic, Norfolk, Virginia, was awarded the 1963 Naval Station Command Trophy for excellence in the Intramural Sports Program conducted by the U. S. Naval Station. The presentation was made in the Naval Station Gymnasium to Rear Admiral E. G. F. Pollard, DC, USN, Commanding Officer, U. S. Naval Dental Clinic, by Captain J. D. Ferguson, USN, Commanding Officer, U. S. Naval Station.

It Happens To Civilians Too. A corporation recently discharged an employee for "off duty" misconduct, the case was appealed in court. The employee was a field representative for the company and was involved in two auto accidents within two weeks during other than working hours. Police reports in both cases showed the employee had been speeding and had "liquor on his breath." He protested that the matter was entirely his own problem since the incident in no way involved the company. Not so, the company replied, the reputation of the company and the rest of its employees was jeopardized by employee misconduct on or off the job.

The arbitrator ruled; "the company has no right to regulate or control the private lives of its employees. However, this general rule is subject to an exception. Where the off-the-job conduct of an employee adversely affects the interests or reputation of the company, such conduct may properly be prohibited. There is no doubt that the company has a right to protection against such damage to its reputation. Management has a right to expect employees -- who are temporarily stationed away from their home plants and are in contact with persons who know them to be representatives of the company -- to conduct themselves with a greater degree of propriety than would be necessary in their normal working environment. The discharge of the employee was justified."

This arbitration re-emphasizes a principle that is fast becoming common law. No man is an island unto himself.

For Those Who Can't Brush After Eating. At the Keflavik Naval Station, Iceland, CAPT G. R. Reynolds has initiated a simple practice in support of sound preventive dentistry. Nine hundred box lunches are prepared each week for flight personnel. The flights are for 12 to 14 hours, and facilities for oral hygiene during that period are limited. To stimulate the best possible oral health under these conditions, pertinent reminders are inserted with the lunches, such as: eat the coarse foods last to take advantage of their tooth-cleansing action, and rinse your mouth thoroughly after eating. This is an excellent example of delivering the message to personnel at the most opportune time.

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OCCUPATIONAL MEDICINE

Hazards from Thermodecomposition of Epoxy Resins

K. J. Leong, MA and H. N. MacFarland, PhD, Ottawa, Ont., Canada, Archives of Environmental Health, 7(6):61-67, Dec. 1963.

Introduction

Epoxy resins are among the most versatile of modern plastics. They have been employed extensively in industry for surface coatings, high-strength adhesives, durable laminates, cold solders, and lightweight foams. Several types of the higher molecular weight epoxies have found application in the potting, encapsulating, and sealing of electrical equipment, particularly electric

motors. Here their high chemical resistance, bond strength, and mechanical and electrical properties can be used to advantage, especially in severe environments. However, with potted electrical equipment, the danger of pyrolysis of the plastic through overheating or its combustion in open fires is always present. In certain military situations, several motors ranging from fractional horsepower to the 10- to 100-horsepower size range may be found operating in relatively confined spaces. The thermodecomposition of epoxy resins may produce an inhalation hazard to personnel working in such areas.

The epoxy resins are polyethers prepared by the interaction of epichlorhydrin with a dihydroxy compound such as bis- (4-hydroxuphenyl)-dimethylmethane (Bisphenol A). The reactive unsaturated epoxide rings permit polymerization reactions in the presence of various curing agents to form molecules of high molecular weight. The uncured thermoplastic resins are thus transformed readily into tough, hard, thermosetting solids. Depending on the type of resin desired, the curing agent may be a polyamine, a phenolic resin, or an acid anhydride. The irritant properties, to the skin, eyes, and respiratory tract, of the uncured epoxy resins, their components, and of the curing agents also have been attributed to the volatility and causticity of epichlorhydrin, the phenolic compound, or the strongly alkaline amines. These materials have been shown to be dermatitis agents and potent sensitizers. Systemic intoxication from these starting materials and uncured resins has been reported. The cured resins are generally regarded as innocuous, although machining operations may produce a fine dust or small amount of vapor that may affect a sensitized person. Direct studies to evaluate the inhalation toxicity of either the pyrolysis or combustion products of cured epoxy resins have not been found in the literature.

The present report described experiments in which rats have been exposed under static conditions to both the pyrolysis and the combustion products of a cured epoxy resin of the type commonly used for potting the windings of electric motors. In the dose ranges examined, only the pyrolysis products proved to be lethal, and estimates of the L(Ct)50 and mean survival time have been computed for these products. A description has been provided of the characteristic types of damage produced in the respiratory tract. In addition, microscopic examination of kedney and liver tissue from representative animals has permitted assessment of systemic toxic effects. The findings have been discussed in terms of the potential human hazard to be associated with the inhalation of these thermodecomposition products.

Results

Observations of Behavior of Animals —— The immediate response of rats exposed to the pyrolysis products of the epoxy resin was holding of the breath, with other indications of respiratory irritation. The signs of irritation soon subsided, and the animals crouched quietly. As the exposure continued, respiration became progressively more labored, and wheezing could be heard when the rats were removed from the chamber at the end of the hour.

These signs persisted until death supervened. The combustion products of the plastic appeared to be much less irritating. The rats remained quiet throughout the exposure period and exhibited minimum signs of respiratory distress. On removal from the chamber at the termination of the exposure, normal behavior and activity were quickly resumed.

Dosage-Mortality Results. —— In pyrolysis studies with the epoxy resin, two sets of four trials each were performed. Sample weights in the first set were 1.0, 1.4, 2.0, and 2.9 gm; and in the second set, 4.2, 6.0, 10.5, and 16.0 gm. It will be noted that a fairly constant fraction of the resin, about 72%-75% in most cases, disappeared as volatile pyrolysis products which formed dense grayish-white fumes throughout the chamber. The temperature rise varied from 4-11 F above room temperature, depending on the size of the sample. No deaths were observed during the one hour exposure period with any sample. However, with the largest sample, 16 gm, the first animal died approximately one hour after removal from the chamber, and all the rats in this group were dead after four hours. The rate of dying was slower and deaths were more evenly distributed with the smaller sample weights. No deaths occurred in the group exposed to the pyrolysis products from the smallest sample, 1.0 gm. In the case of the remaining groups (sample weights from 1.4 to 16.0 gm), no deaths occurred after the third day up to the tenth day when observations were terminated.

Only one sample weight, 20 gm, was tested in combustion trials with the epoxy resin, but the experiment was repeated. Approximately 65% of each sample was consumed when burnt, yielding a quantity of thermodecomposition products slightly greater than that produced when 16 gm of the resin was pyrolyzed. All animals survived throughout the exposure and during the observation period. A mean rise of 39 F over room temperature was recorded in the combustion trials.

Comment

The experiments described above have demonstrated that sufficiently high concentrations of the pyrolysis products of epoxy resin are lethal to rats when inhaled. The data permits computation of the L (Ct) 50 of these pyrolysis products, and, by using the cumulative totals at 72 hours and the method of probit analysis, an estimate of 3.2×10^5 mg min/cu meter is obtained. It is also possible, after making some simplifying assumptions, to derive the mean surival time of rats exposed to the computed L (Ct) 50; a value of approximately 50 hours is found. It is of interest to compare these calculated values with those reported in analogous studies with the pyrolysis products of polyurethane foam and a polyurethane-coated nylon fabric. An L (Ct) 50 of 2×10^6 mg min/cu meter was derived for these polyurethane plastics; therefore, their pyrolysis products are only about one sixth as toxic as those produced by the epoxy resin. Another point of difference in the behavior of animals exposed to these various pyrolysis products should also be noted. With the polyurethane plastics, most of the deaths occurred during the 60-minute ex-

posure period, and, in fact, only a few deaths were recorded during the subsequent observations period. This mean time to death in rats exposed to the L (Ct) 50 was of the order of 30 minutes. This may be contrasted with the value of 50 hours given for the mean time of death of rats exposed to an L (Ct) 50 of the pyrolysis products of epoxy resin.

The histological examination of lung tissues from rats that died after exposure to the epoxy resin pyrolysis products indicated that the primary cause of death was respiratory failure resulting from pulmonary edema. However, respiratory embarrassment may also have been a consequence of histotoxic anoxia, since it was observed that some animals died after exposure to low concentrations of the pyrolysis products and exhibited a negligible degree of edema. It is also possible that systemic toxic effects of cardiac, renal, or hepatic origin may have constituted a contributing factor. The role of excessive heat stress and depletion of oxygen is considered to have exerted no significant effect in causing mortality in the pyrolysis experiments for reasons which have been advanced previously. Microscopic examination of the respiratory passages of rats sacrificed after exposure to the combustion products of the epoxy resin revealed no pathological change; phagocytic removal of foreign particles appeared to be proceeding normally.

The value of 3.2×10^5 mg min/cu meter, derived for the L (Ct) 50 of the epoxy resin pyrolysis products, provides a basis for evaluating the hazard these products may present to the human. It will be assumed that man is at least as susceptible as rats to the action of these materials. The calculations suggest that a man confined in a room of 1,500 cu ft volume for one hour with no appreciable air change would receive a lethal inhalation exposure from the pyrolysis products derived from one pound of epoxy resin. The occurrence of such circumstances in practice is by no means impossible to envisage. Furthermore, the insidious nature of the action of these products, reminiscent of the action of primary lung irritants, strongly suggests that adequate precautions be taken either to prevent their formation or to protect exposed personnel. However, in overt fires where combustion of the plastic with flames occurs, the hazard would appear to be greatly reduced, as was concluded in the case of the combustion products of polyurethane plastics.

Summary

The toxicity of the pyrolysis products of an epoxy resin to rats has been determined. A value of 3.2×10^5 mg min/cu meter has been estimated for the L (Ct) 50 when the exposure period was one hour. The mean survival time in rats exposed to this dose has been calculated to be approximately 50 hours. No deaths were observed when rats were exposed to slightly higher concentrations of the combustion products of the resin.

Histological sections of lungs, kidney, and liver from representative animals have been examined. It was concluded that respiratory failure from pulmonary edema was the predominant cause of death, although other effects, such as histotoxic anoxia and systemic renal or hepatic changes, may have

played a contributory role. No pathological damage was associated with exposure to equivalent doses of the combustion products of the epoxy resin.

It was concluded that the pyrolysis products may constitute a hazard to human personnel in circumstances realizable in practice.

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Preplacement Examinations in Industry Having a Pulmonary Health Hazard

J. W. G. Hannon, MD, Medical Director, McIntyre Research Foundation, Washington, Pennsylvania, Industrial Medicine & Surgery, 33(2):62-64, February, 1964.

The preplacement medical examination in those industries having a potential pulmonary hazard has not received the serious consideration that it deserves in all plants and industries. This type of examination which usually consists of multiple phases has as its objectives the discovery of anatomic, pathologic, and physiologic factors which may contribute to an adverse effect if the applicant is subsequently exposed to hazardous fumes, mists, and dusts.

The initial medical examination should be as broad in scope as needed for each specific exposure, but at no time should the results of this examination be so interpreted as to represent a safety factor that may lead to laxity in the control of any aerial pollutants that may exist in the working atmosphere. Medical control and atmospheric control are not substitutes for each other, but should augment each other.

The scope of the examination may vary from industry to industry but its perfection is somewhat dependent upon the number of tests and studies employed, bearing in mind that the quality of the studies is often more important than the quantity. The severity and type of exposure is a factor in determining the completeness of the examination.

The following should be considered in the preplacement medical examination:

1. Occupational History
2. Past Medical History
3. Complete Physical Examination
4. Chest X-Ray
5. Lung Function Studies
6. Special Studies.

Occupational History

The occupational history should be as complete as possible and should start with a notation of the birth date and subsequent activities in chronological order. The records of full time industrial jobs should be made, indicating the type of industry, the kind of job held, and the duration of employment.

This portion of the history should also include mention of hobbies and part-time jobs in the adolescent and following years. Pulmonary, anatomic, and physiologic damage can and sometimes does occur as a result of short exposures to high concentrations of fine dusts produced by the grinding of products containing silicon dioxides. Amateur ceramic workers may develop mild fibrotic lung changes. Experimentation with electrical units which produce concentrations of ozone may cause physiologic damage to the lungs. The trend of some teenagers to sniff the odors of various chemicals presents a potential danger. The sniffing of scouring powders has been known to produce a serious type of silicosis.

Efforts should be made to evaluate any prior exposure to pulmonary hazards. In the case of prior exposure to silicon dioxide, it must be realized that silicosis is a progressive disease and lung lesions which may be absent on the initial x-ray examination may appear on the chest x-ray at a later date and without further exposure to this compound. Exposure to high concentrations of the so-called inert dusts may lead to the precocious development of silicosis when the applicant is subsequently exposed to this compound. Every effort should be made to determine if prior exposures may have an adverse effect on the applicant if hired.

Past Medical History

The past medical history is important in determining if any health factor is present that may impair the physical integrity of the applicant in the near future, especially if he is exposed to certain aerial contaminants.

Particular attention should be given to tuberculosis in the applicant and his immediate family, and to chronic or recurrent bronchitis, allergies, pneumonia or pneumonitis, particularly if recurrent. A history of anemia, rheumatic fever with cardiac involvement, and renal disease should receive consideration. Chronic systemic diseases should be well evaluated. A history of exertional dyspnea is of great significance and should be carefully evaluated. The physical examination should be complete with special attention to the cardiorespiratory systems. The hearing, vision, reflexes and overall intelligence and attitude are very important as many operations producing pulmonary hazards are dangerous. Also, many have been changed by technical advances and must, of necessity, be manned by keen and alert personnel.

Special attention should be directed toward mouth breathers who do not have the protection of the filtering system of the nose and hence allow a high percentage of aerial dusts to enter the trachea and lungs. In addition, the mouth breather has a higher incidence of lower respiratory infections.

The examination of the thorax should determine the presence or absence of physical signs in the lungs or heart which might predispose the applicant to greater than normal retention of inhaled foreign material.

The examination of the thorax should also include observation of the amplitude of chest wall excursions during normal and forced breathing. Forced ventilation can cause the appearance of abnormal breath sounds not

found during normal breathing.

The examination of the abdomen should be thorough to determine the presence or absence of pre-existing disease.

The record should also include notations of the height, weight, temperature, blood pressure, as well as examinations of the skeletal system, the joints, and the inguinal region for the presence of hernias.

X-ray Examination

The x-ray examination of the chest should be made with proper techniques so that a film of good quality and density is produced. The x-ray film should be used to help screen out those applicants who, through one or more conditions, may be poor risks in a job where there is a pulmonary hazard.

Reasons for rejections on the basis of an x-ray film alone are as follows:

1. Evidence of a pneumoconiosis
2. Pneumonitis
3. Active infection, localized or generalized
4. Extensive healed infection, i.e., tuberculosis, histoplasmosis, sarcoid, fungi
5. Extensive bullous emphysema
6. Significant cardiac enlargement
7. Aneurysm of the aorta
8. Post-thoracotomy scars and associated pleural reaction
9. Tumors, benign or malignant
10. Diffuse lung shadows regardless of their etiology.

Lung Function Studies

It is a well recognized fact that incipient, or an insidious, progressive pulmonary dysfunction cannot always be recognized during the physical examination or on the x-ray film, but can be found through the use of lung function tests. As a result of much study, certain tests of proved value which fulfill the requirements in industry have been developed and used over a significant number of years. These tests are simple in nature, easily performed, not time consuming, and have a reasonable scientific accuracy. The tests can be performed by using a Douglas bag and expressing the expired air through a gas meter for measurement or by using a special Lee adapted gas meter with a counting mechanism to determine the number of respirations during the test and, of course, the use of its usual measuring devices.

The methods that have been in use involve the following measurements: vital capacity, maximum breathing capacity, maximum tidal volume, pulmonary reserve, and functional pulmonary reserve.

Vital capacity tests are carried out in the usual manner and three readings are made. The highest reading is accepted as the value for the subject studied. In our experience with the vital capacity tests, we find that it

is not expecially valuable when single tests are made; but, where yearly estimations are carried out comparative studies obtained on each examination are of great value.

Normal tidal volumes are measured by having the subject seated at rest and collecting all of his expired air for a period of seven minutes. The air is measured and divided by the number of respirations, giving the normal tidal volume or resting oxygen requirements. In other words, the subject must take in so many cc's of air per breath at rest in order to satisfy his body oxygen requirements.

Maximum breathing capacity and maximum tidal volume are measured by having the subject stand and breathe as forcibly as he can for a 20 second period at a respiratory rate of 60 times per minute. The air is collected or measured in a Douglas bag, gas meter, or spirometer. The air is measured and the volume is interpreted as maximum breathing capacity. The volume of air divided by the number of respirations is the maximum tidal volume.

Pulmonary reserve is the difference between the normal tidal volume and the maximum tidal volume. This amount of air represents the reserve ventilating capacity available to the individual when carrying on activities that place a demand on the lungs for more oxygen.

Functional pulmonary reserve is measured by taking 60% of the observed pulmonary reserve and adding the normal tidal volume.

These tests have been carried out over a period of 16 years, and approximately 40,000 tests have been performed on men who are either in the status of applicants or in yearly studies of the pulmonary function. The tests correlate well with the symptomatic history, the industrial history, the physical examination, and the x-ray. As a word of warning, all lung function tests are greatly modified by the presence of an acute bronchitis or tracheolaryngitis. A reduction by as much as 50% in the pulmonary function can be expected during the period of the infection, and a lesser amount of measurable impairment will last for two or three weeks after the workman has become asymptomatic.

Special Tests

Special tests are optional and may be of a specific nature for a particular industry, or may be indicated as a result of questionable findings during the history, physical examination, x-ray film examinations, or the lung function tests. For instance, skin testing may be done to determine the degree of allergy to the exposure material. Other examples of special tests are the employment of the electrocardiogram in applicants with suspicious heart disease, and routine blood chemistry where indicated.

Summary

The preplacement medical examination in industries having a pulmonary hazard is an important factor in the prevention of industrial lung disease.

The scope of the examination must be determined by the severity and type of the hazard, the economics of the industry, and other factors that may be of an uncontrollable nature.

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Requirements for Heat Protective Clothing Discussed

Industrial Hygiene News Report published by Flournoy & Associates, 1791 Howard Street, Chicago 26, Ill., VI(11):3, Nov. 1963.

Technical methods for fashioning heat protective garments were outlined by B. Metz of the Laboratory of Applied Physiology, Faculty of Medicine, Strasbourg, France, at the XIVth International Congress on Occupational Health in Madrid, September 16 to 21. The methods were discussed in terms of the functions performed:

1. To hinder the entry of ambient heat: An aluminum coating of the outer surface of the garment that will neither tarnish nor get dirty is necessary for it to maximally reflect radiant heat. Overcoats of polished metal platelets similar to coats of mail were proposed to be worn over ordinary insulated garments to avoid some inconveniences of garments made of metal-coated fabrics. Insulation of the garment may be through a lining of carded cotton, glass wool or foamed plastic to decrease the heat flow from the outer to the inner face of the garment. Dynamic insulation in which the air flows outwards through the whole covering area of the garment will reject the heat gained by the outer face of the garment. By wetting the shell of the garment, either prior to exposure to heat or during, the heat gained by the garment will be lost by evaporation of water toward the ambient air.

2. To get rid of the heat entering or produced within the garment: Air cooled by conventional refrigerating machinery, evaporative cooler or vortex cooler, may be blown inside the garment. The heat that has entered the garment may be absorbed by means of a "heat sink," consisting of cold water circulated from the outside, eutectic mixture previously frozen at a point below its melting plateau, or thermo-electric heat pump applying the Peltier effect. Whichever process is involved, it is necessary to provide for internal circulation of the air enclosed between the body and the garment and to provide for some renewal of this air to keep the CO_2 concentration below 2%.

3. To avoid heat damage to the garment: The garment should be made of materials which will remain unaltered at the temperature of their regular use and which will also be fireproof, in case of back-fires or splashing of molten metal.

4. To maintain efficiency of the worker wearing the garment: A metal coating of the plastic or glass window with which the aperture for vision is fitted will reduce the radiant heat load to the face. Gloves should have enough insulation to permit the handling of hot objects with manipulatory freedom. The soles of shoes or boots should be sufficiently insulated so that the foot

can withstand contact with a hot floor, and skin temperature not exceed 40° C (104° F).

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Carbon Monoxide Hazard to Commercial Vehicle Drivers Studied

Industrial Hygiene News Report, VI(10): Oct. 1963. Consultant Editor Howard N. Schulz, published by Flournoy and Associates, 1791 Howard Street, Chicago 26, Ill.

Are the concentrations of ambient carbon monoxide to which commerical vehicle drivers are exposed in the course of a day's work sufficient to constitute a hazard? A report on the subject was presented at the XIVth International Congress on Occupational Health in Madrid, September 16 to 21, by Warren A. Cook, Professor of Industrial Health, University of Michigan (Ann Arbor, Mich.). Mr. Cook was one of eight university faculty members sponsored by the U. S. Delegation of the International Association on Occupational Health. Among salient points included in his presentation were these:

1. It would appear that the threshold value of CO-hemoglobin saturation necessary to cause increased accident susceptibility would be no less than 15% and no more than 20% depending on the criteria employed and interpretation of criteria.

2. A 20% CO-hemoglobin saturation would occur on continued exposure to a concentration of 160 ppm and 15% on exposure to 110 ppm.

3. Blood samples taken at 2 hour intervals from two persons in a police car being driven around in high traffic areas of the city over an 8 hour day all indicated less than 4% CO-hemoglobin saturation. CO concentrations inside the car averaged 17 ppm with a peak of 120 ppm when the car was stopped and the engine idling. Blood samples of one of the two subjects who was a non-smoker ranged from 0.8 to 1.2% CO-hemoglobin saturation while those of the other who smoked cigars most of the test period ranged from 3.1 to 3.9%.

4. With only one exception, the blood analyses of 227 persons involved in traffic accidents in the Detroit area showed less than 12% CO-hemoglobin saturation. The single exception was attributed to a leaky exhaust system.

5. Carbon monoxide concentrations obtained from three locations in Detroit over a period of a year, by means of continuous-recording non-dispersing infrared spectrophotometers, showed that commerical vehicle drivers would be subjected to a 9 hour exposure to ambient CO concentrations which would range from 12 to 25 ppm during the first hour and a half of each day, then fall to 10-18 ppm during most of the day and rise to 17 to 32 ppm over the last hour and a half.

Based on these data, it was concluded that present traffic conditions in Detroit produce insufficient carbon monoxide to constitute a hazard either to health or to driving ability; however, statistical treatment of the findings

indicated that a combination of increased traffic load together with meteorological conditions favoring accumulations of exhaust gas may result in excessive concentrations of carbon monoxide.

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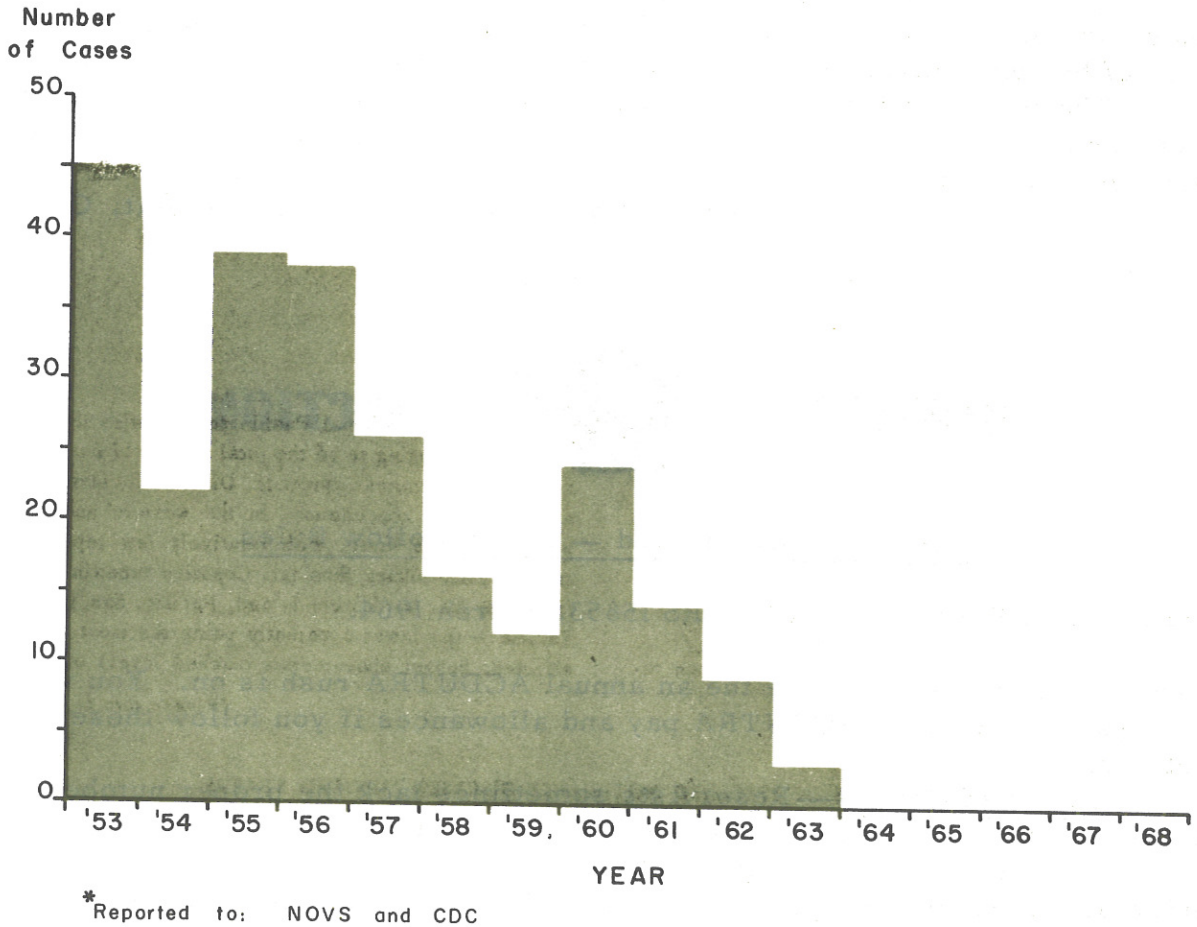
Cases of Human Anthrax,* 1953 - 1963

Morbidity and Mortality Weekly Report, DHEW-PHS, 13(8):62, Feb. 28, 1962.



Anthrax Surveillance Summary – 1963

Three cases of human anthrax were reported during 1963. This figure represents a continuation of the downward trend of this disease to its lowest point since reporting began. The above histogram depicts the pattern of human anthrax occurrence over the last 11 years. The decline in cases is probably related to several factors including the use of the anthrax cell-free vaccine in high risk industrial populations, continued improvements in industrial hygiene, and the decreasing imports of animal products associated with Bacillus anthracis contamination.

Females comprised the 3 cases occurring in 1963. All had industrial contact with the organism; 2 worked with goat hair and one with wool. All cases were of the cutaneous type, diagnosed clinically without laboratory confirmation; there were no fatalities. None of the patients had been immunized with the cell-free anthrax vaccine at the time of infection. One of the 2 goat hair associated cases occurred in a new employee, who had not been immunized during the 2 weeks of her employment. The other 2 cases occurred in individuals working in plants whose employees were not immunized. (Limited supplies of the vaccine are available for selected high-risk groups upon request from the CDC.)

This is only the second year since 1916 when no agriculturally associated cases have been reported. A similar situation occurred in 1961 when all 9 cases of human anthrax were industrially associated.

The only significant animal outbreak of anthrax reported in 1963 occurred among deer in Arkansas. This outbreak resulted in approximately 400 deaths, a loss of 70 to 90 percent of the deer population in the involved area.

(Reported by Anthrax Investigations Unit, CDC.)

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RESERVE SECTION

ACDUTRA Pay Speeded — If You Follow Rules

The Naval Reservist, NAVPERS 15653, March 1964.

It won't be long, now, before the an annual ACDUTRA rush is on. You will speed payment of your ACDUTRA pay and allowances if you follow these suggestions:

Copies of Orders—Reservists sometimes lack the proper number of certified copies of orders, or have incomplete orders.

All Reservists are required to have the original and eight certified copies of orders in their possession, complete with all endorsements, including the signature of the Reservist acknowledging receipt of orders, when reporting for ACDUTRA.

Don't detach any of the copies of the orders you receive unless you have more than the minimum number required. If you submit fewer than the required number, the disbursing office may return the orders to you for the purpose of preparing additional copies yourself—or having them prepared by the personnel office.

Make sure you have all necessary endorsements completed before you submit your set of orders to the disbursing office.

Basic Allowance for Quarters (BAQ)—You can save yourself lots of

time if you have your substantiating documents for BAQ completed and certified before you report for ACDUTRA.

Officers must file Dependency Certificate—Wife, or Child Under 21 Years, NavCompt Form 2040. In addition, the Dependency Certificate—Mother and/or Father, NavCompt Form 2040-1, is required when it is appropriate.

Enlisted Reservists must file Application for Dependents Allowances, NavPers Form 668.

Failure to have these forms completed and ready for submission when requested will hinder or delay payment of your BAQ. Whenever possible, obtain the necessary forms from your Naval Reserve Training Center, and have them completed there.

* * * *

ATTENTION: Reserve Nurse Corps Officers on inactive duty

This is an excellent time for you to return to active duty if you are qualified and interested. We have vacancies due to normal attrition and increasing numbers for voluntary retirements. If you hold the rank of Lieutenant Junior Grade or Lieutenant and could complete 20 years of active duty before reaching age 55, you may apply. Application for recall to active duty NavPers 2929 may be obtained at the nearest naval recruiting station.

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Reservists Eligible for Tax Deductions

The Naval Reservist, NAVPERS 15653, March 1964.

You may be eligible for additional federal income tax deductions if you've been taking an active part in the Naval Reserve program.

If you are serving on inactive duty, you may deduct amounts spent for the purchase and maintenance of your uniforms; you may also deduct transportation expenses involved in attending drills.

Here is a brief summary of allowable tax deductions for Reserve participation:

Uniform Cost, Maintenance

You may deduct unreimbursed amounts spent for the purchase and maintenance of uniforms for federal income tax purposes. Your deductions will vary according to whether you are on inactive duty or extended active duty. An Internal Revenue Service ruling states that the deduction is allowed as an "ordinary and necessary business expense" when uniforms are required and allowed to be worn only when on active duty for training for temporary

periods, when attending service school courses, and training assemblies (drills).

If you are on inactive duty, you may deduct not only the cost of uniforms required for training duty and drills, but the maintenance costs of these uniforms. However, if you receive a uniform gratuity, your expenses are deductible only to the extent that they exceed your uniform gratuity in that particular year.

For example, you may deduct the cost—purchase price and maintenance—of uniforms bought in 1963, when you file your 1963 federal income tax return. If you received a uniform gratuity of, say, $100, and the cost and maintenance of your uniforms amounted to $175, you may deduct $75 on page 2 of your tax return (Form 1040). If you received no uniform gratuity in 1963, you may deduct the entire sum—in this example $175. A uniform gratuity received in a year is nontaxable and need not be considered, except as an offset against uniform expenses incurred during that same year.

(Reservists serving on full-time active duty may only deduct the cost of all items of insignia denoting rank and corps.)

(To be continued)

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